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SCIENCE NEWS LETTER

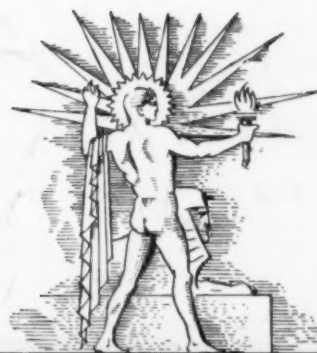
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THE WEEKLY SUMMARY OF CURRENT SCIENCE •



September 28, 1940

Spectral Bouquet

See Page 200

A SCIENCE SERVICE PUBLICATION

Do You Know?

Apples with red flowers, red skin, and red flesh are recent attractive additions to the fancy fruit stock of this country.

A Philadelphia physician in 1807 had a druggist prepare carbonated water flavored with fruit juice for patients.

Government plant scientists are keeping an eye on trees in tung orchards that seem frost-resistant, as possible sources of resistant stock.

Chemists explain that soap is added to most automobile greases to give them the oiliness and staying power which they do not possess naturally.

The Netherlands is not likely to send flower bulbs to the United States this year, but Great Britain expects to export bulbs to America.

Studying oil wells in nearby developed fields, government geologists say that new oil pools may be found in the Osage Indian Reservation in Oklahoma.

Preventing eye accidents in industry is dramatically taught in "The Eyes Have It," new sound slidefilm sponsored by the National Society for the Prevention of Blindness, New York.

Despite presence of the Dutch elm disease in areas of the United States, a Cornell University plant pathologist advises that the American elm still be planted where it is the most logical tree to use, but only if facilities are provided for the tree's protection.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

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RADIO

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RESOURCES

Why is lavender scent scarce in England? p. 200.

The drum language by which signals are sent for miles in Africa is difficult, says an ethnologist, and few white men understand it.

First institution known to have been called a museum was founded in Alexandria about 300 B.C., and was a place for philosophic and other advanced studies.

A University of California agriculturist is spending six months in Australia studying sheep, hoping to find sheep that will improve wool quality of California flocks.

Cotton fibers complete their growth in about 35 days, with little change after that until the boll opens, experiments show.

A novel machine for testing warmth of fabrics is equipped with refrigerating units, heating coils, blowers, and other "weather" makers.

In a Connecticut survey of traffic on straight rural highways, it was found that drivers accompanied by relatives travel more slowly than those alone or with friends.

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MEDICINE

New Measles Vaccine Successful in First Trials

Army Officials as Well as Parents Will Welcome It; Country Lads in World War Had Disease Severely

SUCCESS in vaccinating a small group of children against measles, widespread childhood ailment that often leads to pneumonia and serious ear trouble, has been achieved by Dr. Joseph Stokes, Jr., University of Pennsylvania Medical School, and Dr. Geoffrey Rake, Squibb Institute for Medical Research, New Brunswick, N. J.

Army officials as well as parents throughout the land will hail this promise of triumph over measles, announced at the University of Pennsylvania Bicentennial Conference in Philadelphia.

During the last World War, it was pointed out, measles became one of the commonest causes of death in the Army. This was because thousands of country

lads who had never had measles due to their relative degree of isolation during childhood contracted the disease after they got into Army training camps. Many of them not only had measles but a severe and often fatal pneumonia as a complication of the measles.

The new anti-measles vaccine was made by growing the measles virus or germ on fertile hen's eggs. Apparently the virus becomes weakened or attenuated while growing in this environment and when injected under the skin or placed within the nose it produces a very mild type of measles in some children and no symptoms at all in others.

Two groups of children in New Jersey and Philadelphia, with the permis-

sion of their parents and health authorities, gave the new measles vaccine its first trials. None of the children had ever had measles. One group was vaccinated and the other was not. Both groups were then given injections of measles virus from patients who had measles. The unvaccinated children came down with measles, but the vaccinated ones did not. This was most encouraging, but Dr. Stokes pointed out that the number of children in these trials of the vaccine was too small to be entirely sure of the value of the vaccine.

Permission to make the tests was readily given by parents as well as health authorities because neither group of children ran very much danger. In the first place, they were all likely to get measles at some time in their lives, since 98 out of every 100 children are susceptible to it. In the second place, the trials were made in spring, the season when measles is least likely to be followed by ear trouble, pneumonia or other complications. Besides this, the children all had the very best medical and nursing care to help them recover safely from the ailment.

Production of large amounts of the vaccine, it is said, will not be difficult and it can be preserved for long periods.

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ALPHABETICAL QUADRUPLETS

Anthony, Bernard, Carl and Donald surprise scientists because no two of them are alike. They differ mentally as well as in appearance. This photograph is from the Journal of Heredity.

HEREDITY

Scientists Amazed by Quads; Only One of a Kind in Four

"ALMOST a miracle," is what scientists say about four little Texas boys, nicknamed the Alphabetical Quadruplets because they are named Anthony, Bernard, Carl, and Donald—A., B., C., and D.

These Perricone quads seem to be the only all-male set now living in the United States. But that is only one of their unusual qualities, described by Dr. Iva C. Gardner, Baylor University psychologist, and Dr. H. H. Newman, biologist, in the current issue of the *Journal of Heredity*.

These quads are all what is known to scientists as non-identical—just four ordinary brothers who happened by the most remarkable chance to be born at the same time.

Quadruplets, like twins and other multiple births, may come about in two ways. The cells developing from a single egg cell, or ovum, may through a biological accident split apart and form two or more perfect individuals. The twins formed in this way are called identical because they are so exactly alike in physi-

cal and even mental and personality characteristics. They may be mistaken for each other even by their parents. The Dionne quintuplets are believed to be all identical.

But twinning may occur also by another sort of biological accident, the simultaneous development of two or more egg cells and their fertilization at the same time. Twins formed in this way may not be any more like each other than other brothers and sisters and may be of different sexes.

Quadruplets could thus be of four combinations—all identical, two pairs of identical twins, identical triplets and an odd one, or four brothers or sisters, no two of whom are identical. The chances of the last occurrence—four separate egg cells developing safely to maturity at the same time—are extremely small.

Yet the Alphabetical Perricones represent just such a fabulous occurrence. And to add to their rarity, they are all boys. The chances that non-identical quadruplets would be all boys is only one in 16.

Psychological studies by Dr. Gardner reveal that these four brothers are just as different in mind and temperament as they appear physically. Although they are all just about average in intelligence, Carl's IQ is 10 points higher than either Anthony's or Donald's and five points higher than Bernard's. The particular questions they do well on are different.

Carl and Bernard rush ahead and make quick decisions. Anthony and Donald deliberate longer. Donald misses questions that have to do with reading, but he is very good in detecting absurdities. Anthony and Donald are better than either Carl or Bernard on the non-reading performance tests.

These little boys were born of Italian parents on October 31, 1929, on a small truck farm near the outskirts of Beaumont, Texas.

In physical appearance, Bernard and Carl are more alike than any other pair among the four. But Bernard has medium chestnut hair and light brown eyes while Carl has dark brown hair and dark brown eyes. Carl is two inches taller than Bernard. And Bernard has freckles.

Anthony is also freckled, but is fair with bluish-gray eyes. He is the only left-handed one of the quads.

The boys have five older brothers and each of the quads has one older brother whom he resembles more than he does any one of the other quads.

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MEDICINE

Anti-Bleeding Vitamin K May Prove Weapon Against Cancer

Vitamin K Favors Production of Prothrombin; This In Turn May Protect Body Against Cancer Causers

VITAMIN K, the vitamin that is saving new-born babies and sick adults from bleeding to death, appeared in the new role of a possible weapon for the fight against cancer in a report by Dr. Louis F. Fieser, of Harvard University, to the University of Pennsylvania Bicentennial Conference.

Prevention of cancer by means of this vitamin is the possibility, admittedly purely speculative as yet, which Dr. Fieser suggested to fellow scientists as a result of recent chemical studies of both the vitamin and cancer-causing chemical compounds.

Vitamin K prevents bleeding in certain cases because it favors production in the body of prothrombin, the blood constituent necessary for proper blood

clotting. A recent report from Duke University researchers on this point indicates, Dr. Fieser said, that the chemical relationship between the vitamin and prothrombin is similar in certain ways to a detoxifying of cancer-causing chemicals that has been observed in laboratory animals.

"On the hypothesis that a cancer-producing hydrocarbon can be detoxified by interaction with suitable disulfide compounds," Dr. Fieser said, "it is conceivable that one of the normal functions of prothrombin may consist in the protection of the body from incidental carcinogens (cancer-causers). This would suggest the possibility that maintenance of prothrombin at the top level of activity by administration of vitamin K



SENSITIVE

Even the hard of hearing can make use of the electrical microphone stethoscope now available for U. S. Navy physicians. A volume control and filter makes it possible to separate normal heart sounds from abnormal sounds.

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may produce a condition favorable to the inhibition of hydrocarbon carcinogenesis, and experiments to test this point are in progress."

The cancer-causing chemicals are coal-tar derivatives. London chimney sweeps were the first recognized victims of cancer from tar compounds. Such cancers are rare in humans today, because the danger is known and can be avoided. Studies of the cancer-causing substances from tar, however, have shown that they are very similar to chemicals naturally found in the body, such as the bile acids and several hormones from the ductless glands.

Cancer may arise, according to one theory, from a defect in body chemistry by which cancer-causing chemicals, instead of harmless and useful ones, might

be formed. Assuming that this might be the case, Dr. Fieser and associates have studied animals to see what might become of the chemicals.

Rabbits fed some of the cancer-causing substances failed to get cancer and excreted from the kidneys what appeared to be detoxified derivatives of the original malignant compound. Study of the chemistry involved led Dr. Fieser to the theory of vitamin K as a possible protector against cancer that might be due to faulty body chemistry.

The place where the body chemistry might go wrong, producing cancer-causing substances by mistake, is, he believes, the cortex of the adrenal glands which produces the hormone that saves the lives of Addison's disease patients.

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BIOLOGY

Parties and Petting Observed Among One-Celled Animals

Paramecium Seems To Recognize Castes and Have Taboos Against Cousin Marriages; Fix Hours for Social Events

THE sex drive, the urge to find a mate, underlies social behavior among animals clear down to the very bottom of the evolutionary scale, Prof. H. S. Jennings of the University of California at Los Angeles pointed out before the University of Pennsylvania Bicentennial Conference in Philadelphia.

Prof. Jennings has made an intimate study of the behavior of the microscopic one-celled creatures known as Paramecia or (because of their shape) as slipper-animals, that swarm in stagnant fresh water. He has found types of behavior startlingly similar to parties, petting or flirting, and the formation of family groups or clans with rigid taboos against cousin marriages.

Ordinarily, these tiny slipper-animals reproduce by simple division. One cell splits and makes two; these separate and in turn become four, and so on. But occasionally they do resort to sexual reproduction. Two cells unite temporarily, exchange protoplasm, and then swim away again, to continue the race. It is here that the social behaviors watched by Prof. Jennings begin.

The clan or family groupings which Prof. Jennings observed are rather complex. In one group, there are four mating types or castes. Members of the same

caste will not mate with each other, but will mate with individuals of the other three castes. There is a second group of eight castes, none of which will have anything to do with the castes of Group I, but each of which will mate with the other seven castes in its own group. Finally there is a third group of four castes, likewise snobbish toward the twelve castes in the first two groups. Thus there are in all, in this microscopic universe, three tribes of 16 castes, with a most complex set of taboos.

However, when groups of individuals which will consent to mate with each other are mixed, they do not proceed to pair off immediately, but "hold a party". They bunch together in tight crowds, clinging as tightly as if they were all covered with glue. Only after this "party" breaks up do the individuals pair off and actually mate. There are even fixed hours for the parties; they start only between 8 and 9 in the morning and at 5 or 6 o'clock in the afternoon.

Sometimes, instead of mating at once, a pair of the little animals will remain in casual contact, swimming along in spirals. This may last for only a few seconds—a temporary flirtation. Or it may continue for a much longer time, ending in mating—a real courtship.

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Anti-Influenza Defenses

THE NOSE has two defenses against influenza, one of which may also operate against infantile paralysis, Dr. Thomas Francis, Jr., of New York University College of Medicine, told the Conference.

For protection against influenza, it appears from his discoveries, scientists will have to find methods of bolstering these nose defenses rather than methods of bolstering general body defenses such as are successful in protecting against diphtheria and smallpox, for example.

The two nose defenses, he believes, may complement each other in affording protection against influenza.

One of them, found in humans, consists of antibodies in the nasal secretions that can inactivate the influenza germ or virus. Antibodies are one of the body's defenses against many other germs, but are generally found in the blood. Influenza-fighting antibodies are also found in the blood, but their presence there does not protect a person against influenza, Dr. Francis has found.

The other nose defensive mechanism against influenza, discovered in ferrets, is a change in the character of the tissue cells lining the nose and upper respiratory tract. This change comes during an attack of influenza and consists in the destruction of many of these cells, followed by their regrowth in a form highly resistant to subsequent injury by influenza. The resistance, however, is not lasting, disappearing as the resistant repair cells are replaced by normal cells.

Tests of the nasal secretions of 668 normal persons, of ages ranging from three months to 30 years, showed that the flu-fighting antibodies are apparently present at birth, disappear during the first two years of life, and then increase again. The highest proportion of samples containing influenza virus-inactivating substance was found among persons from five to 19 years of age.

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Eat Fats and Vitamins

EAT more fats and vitamins and less sweet and starchy food to protect yourself against tooth decay, is the advice of Prof. Elmer V. McCollum, Johns Hopkins University.

A still unidentified substance, present in the saliva or mucous secretions of the mouth or both, plays a part in suppressing germs that affect tooth health, Prof. McCollum is convinced. People who have good teeth probably have plenty of this

substance. People whose teeth decay easily probably do not have much of it. Its presence presumably depends on good nutrition. Until more is known about it, the best protection against tooth decay is a good diet and frequent visits to the dentist to check earliest spots of decay.

The advice to eat more fats and less sugar and starches comes from experience with diabetics who must follow such a diet because of their ailment. Although they have cavities in their teeth, the walls of the cavities are said to be unusually hard and to have resisted the spread of the decay.

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Operate for Schizophrenia

SUCCESS with a brain operation for schizophrenia, commonest form of mental disease, was reported by Dr. Edward A. Strecker, of the University of Pennsylvania School of Medicine, at the University's Bicentennial Conference.

The outlook for the "forgotten patients" who have resisted all efforts to penetrate the defenses of their imaginary world and are "dreaming away their lives in quiet corners of mental hospitals" is no longer so hopeless, it appears from Dr. Strecker's report of results with both the new operation and the electric and drug shock treatments now being used for schizophrenia.

Patients who had been hopelessly insane for more than ten years, and who had not been helped by any other method of treatment, were helped to an "amazing" degree by the brain operation, Dr. Strecker said, although it did not effect complete cures.

The operation is known technically as prefrontal leucotomy, meaning that the white matter in the prefrontal lobes of the brain is cut. Dr. Egas Moniz, of Spain, originally devised the operation. Dr. Walter Freeman and Dr. James W. Watts, of Washington, D. C., introduced it into this country with some modifications for patients in late middle life suffering with agitated melancholia. Trial of this operation for relief of schizophrenia was proposed by Dr. Strecker.

The eight patients whose cases Dr. Strecker reported were operated on by Dr. Francis Grant, of the University of Pennsylvania.

"The results," Dr. Strecker reported, "were interesting and sometimes truly amazing. The aggressiveness, in some instances homicidal in degree, disappeared; mental material which one would have believed irretrievably lost was ap-

parently salvaged by the operation and was utilized by the patient in establishing realignments with life; panic reactions due to hallucinosis were terminated. The hallucinosis continued but a recall of the patient to reality in some of the cases was very easy, a few simple questions sufficing."

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Urge Marriage Advice

PSYCHIATRIC treatment, not merely for mentally ailing individuals, but for whole sick nations, was urged as a basic need before the meeting by Dr. Arthur H. Ruggles, secretary of the American Psychiatric Association. He raised some questions which he challenged fellow psychiatrists to answer:

"Groups are being faced with limitation through mass sterilization. Are we to subscribe to the wholesale sterilization of the defective and of what are called the inferior? It might be easy to answer this question regarding the defective, but is the psychiatrist or anyone else yet able to give an accurate answer to what is inferior stock?"

"Is it well for the mental health and efficiency of human beings for them to be long deprived of the freedom of speech, the freedom of the press, and the encouragement of individual initiative? The psychiatrist from his vantage point would definitely say that these restrictions imposed by some social groups are unwholesome and lead to repression and emotional conflicts. Our experience seems to bear this out and, therefore, we must raise our voices in protest against it lest we develop a nation of insecure, unhappy and relatively inefficient people."

The psychiatrist, in Dr. Ruggles' opinion, can contribute materially toward the solution of the increasingly pressing divorce problem, by helping to prevent marriages foredoomed to end in the divorce court. On this point, he said:

"No group nor nation can hope to be mentally well while divorce increases three-fold in fifty years and exceeds by many times the divorce rate in any other national group. How can a country hope for national health when the feeble-minded, psychopathic, neurotic and psychotic are permitted to marry and raise progeny without any psychiatric evaluation? Psychiatric consultation with the parents, lawyers and clergy would prevent many a marriage doomed to failure and much psychic trauma to children, as well as help to make divorce something other than a regional racket."

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Single Photon May Kill

TO KILL or maim a living cell with radiation, it is not necessary to riddle it with bullets (photons) of light or X-rays, like the machine-gunned victim of a gangster massacre. A single one of these invisible missiles will do the work if it hits a vital spot, Dr. Paul Henshaw, research fellow of the National Cancer Institute, Bethesda, Md., declared in an address before the University of Pennsylvania Bicentennial Conference.

Dr. Henshaw's experiments were performed on single, free-existing cells, like eggs of sea urchins, sperm of fruit-flies, yeasts and bacteria. His conclusions do not hold directly for large aggregations of interdependent cells like the human body.

The vital spot that must be hit in a cell is one of the sub-microscopic control units known as a gene, hidden within the cell's nucleus. Sometimes a sperm or egg cell that has been thus hit will produce very strange effects in the offspring.

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Workers Don't Live for Pay

THE IDEA that workers live only for their pay check was challenged by Dr. Morris S. Viteles, psychologist of the University of Pennsylvania at the Bicentennial Conference.

The demand for increased wages, he said, may be merely a way of expressing fundamental dissatisfaction with an organization that fails to provide for the deep-seated intellectual and spiritual needs.

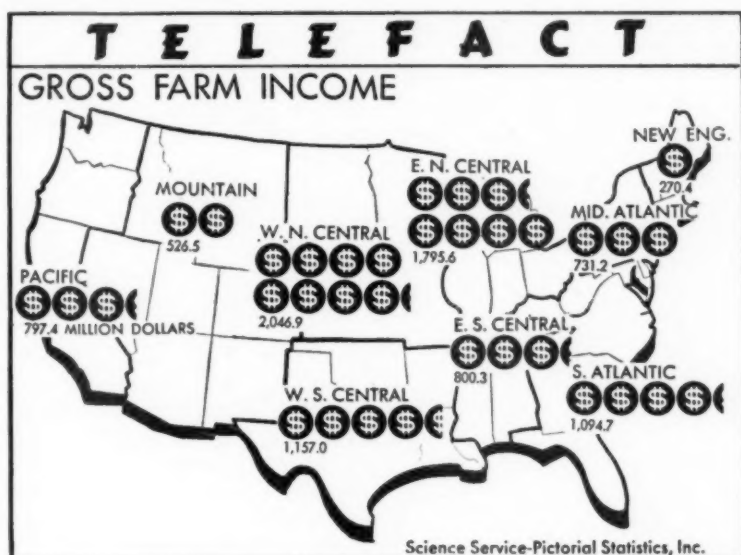
Dr. Viteles denied that the psychologist is primarily concerned with increasing efficiency in production. He must study the possible consequences of our industrial order in mechanizing the mind, creating mental conflicts, and diminishing creative power.

Civilization is not to be judged by a material yardstick, he declared.

"There is little merit in a civilization which dulls the mind, warps the emotions, destroys the will, and reduces the individual to an automaton, even though it succeeds in providing an ever-increasing supply of material goods for general distribution."

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The library of the American Medical Association, which ordinarily receives 1,400 periodicals, reports that *medical literature* from Europe is scarce these days.



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ASTRONOMY

Clouds of Calcium, Sodium Found To Vary in Density

In Our Part of the Universe They Are Thinner Than at Great Distances; Less Dense Than "Vacuum"

IN OUR part of the universe clouds of calcium and sodium between the stars are thinner than in more distant regions, Dr. Theodore Dunham, of the Mt. Wilson Observatory, reported in a paper presented to the American Astronomical Society meeting at Wellesley College. The density of these clouds is different in different directions.

Towards Spica, bright star in Virgo seen in the southwest in summer evenings, the calcium particles which the astronomer can detect are four times as numerous as towards Alkaid, the star at the end of the handle of the Great Dipper. Even this is much less than the concentration found by other astronomers for more distant stars.

"This indicates," states Dr. Dunham, "that there is probably a region of lower than average density close to the sun."

Even in distant regions, the density is lower than a high vacuum on earth. Only the passage of light through great numbers of molecules in enormous distances produces an effect.

Dr. Dunham's measurements were made with the 100-inch telescope at Mt. Wilson, by photographing the stars' spectra with high power. Movement of the stars away from or towards the earth

produces a shift in the position of the lines in the spectrum. Since this motion is not shared by the calcium and sodium clouds in between, they produce lines that are not shifted, and can be distinguished from those of the star itself.

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Cooperation Urged

PRESERVATION of the framework, at least, for international cooperation among astronomers was urged by Dr. Robert G. Aitken, director emeritus of the Lick Observatory, in his address as retiring president of the Society.

"We must give thought," he said, "to the individual astronomers from war-torn countries who may find their way to this country; but this is part of a far larger problem involving the welfare of all professional men who are driven from home, and must be given over to some general organization like the American Association for the Advancement of Science, so far as scientific men are concerned. The astronomers will want to do their part generously, but particular care must be exercised that we do nothing to place in jeopardy the careers of the young astronomers trained

in our own universities and observatories.

Giving full credit to the important work that can be done with telescopes like the 200-inch now being constructed, and even larger ones that may come in the future, Dr. Aitken emphasized that smaller star cameras, such as the Schmidt or Ross type, are needed for the solution of some of the most urgent present-day problems in astronomy, such as "the structure and rotation of the galaxy and the relation of our galaxy to others comprising the greater universe."

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Largest Schmidt Camera

AN important step in this direction was announced by Dr. Harlow Shapley, director of the Harvard College Observatory, who told the astronomers that a powerful Schmidt camera, larger than any now in use, is nearing completion at the Oak Ridge, Mass., station of his Observatory. Erected in honor of Prof. and Mrs. James R. Jewett, it is called the Jewett Memorial Telescope. The mounting, designed by Dr. George Z. Dimitroff, superintendent of the Oak Ridge station, was built in the observatory shops at Cambridge, and has now been placed. The glass parts, a concave mirror two feet across, and a correcting lens 33 inches in diameter that will be used in front of it, have been made by the Perkin-Elmer Corporation, and will be installed shortly. This telescope will be working in a month, he said, and will be used for counting stars, and studying galaxies and variable stars.

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Radio Good Before Spots

SUNSPOTS, magnetic disturbances and northern lights they produce on the earth, have a bad effect on radio after they happen, but the transmission of wireless waves is particularly good for about a week before such outbursts, stated Dr. Harlan T. Stetson, Massachusetts Institute of Technology. Four days before the auroral display it is best.

Bad reception follows the aurora for about a week. It is worst two days after the aurora with broadcast waves, and at the same time for short waves used in transatlantic communication. Dr. Stetson attributed this effect to changes produced by the ultraviolet light of the sun in the ionizing layers which reflect long distance radio waves back to earth again.

Most of Dr. Stet- (Turn to page 204)

RESOURCES

War Causes Shortage Of Famous Lavendar Scent

HARDSHIPS of war in Britain now include a shortage of lavender oil, foundation of the famous English lavender water and other toilet articles. The lack is noted in a communication to *Nature* (Aug. 31), by H. S. Redgrove, of Pangbourne, Berks.

Although there is some domestically produced lavender in Britain, the bulk of the supply used in the toilet-goods industry has always come from France, which is now in no position to produce or export the scented plant. Lavendar growing has been tried with promising results in Kenya (Africa) and also in Western Australia, but these overseas sources have not been developed to the point of commercial production.

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METEOROLOGY

Hurricane Was Away From Ordinary Path of Weather

THE HURRICANE that smashed across Nova Scotia on Sept. 16 and the famous 1938 hurricane that spread ruin in New England were storms off the beaten path of American weather.

If meteorologists used such language they might describe these abnormal storms as "flukes."

Usually the immense masses of whirling air, born in the Atlantic near the Cape Verde Islands, come west to the Caribbean region and then rush up the Atlantic Coast. There they are forced out to the sea by masses of high pressure air over the mainland. They vent their fury on the ships at sea.

Both the recent storm and the New England hurricane were guided by two such masses of high pressure air, one inland and the other a high pressure area out to sea that channeled the storms toward land and man's puny things there.

It is just unfortunate that such a condition of the atmosphere forced the 1938 storm over New England and this week's storm over Nova Scotia with its teeming Halifax port so vital to British supply efforts.

Ordinarily, explained R. Hanson Weightman, of the U. S. Weather Bureau, high pressure over the northeastern section of the country pushes such a hurricane out to sea about the time it has travelled northwards along the coast as far as Cape Hatteras. Then it travels

to the northeast and heads out to sea, where it is largely dissipated.

Once in a while, however, the high pressure area may move out to sea, and a channel is formed between it and one to the west. The air in a high tends to move counter-clockwise. At the western edge of the trough the winds are from the north while at the eastern edge they are from the south, thus guiding the storm on its way. The work of the Weather Bureau is to time and plot the movements of these areas, and the hurricane track that moves with them.

The famous New England hurricane, which occurred two years ago, was guided by a very slow moving high which remained off the coast, and caused this storm to move northerly, over the regions where so much damage was done. The conditions this year made the Nova Scotia hurricane move to the north northeast instead of northeast.

This seems to be a normal hurricane season, so far as numbers are concerned. Usually this period, from June to October, brings about a half dozen such storms.

Science News Letter, September 28, 1940

CHEMISTRY

Melamine, Once Rare, Now Used in Plastics

MELAMINE, two years ago a rare chemical selling at \$40 per pound, and now listed at 55 cents per pound as a result of its production on a quantity basis, is the raw material of a whole new family of valuable resins used in paints and plastics. (American Cyanamid Co., Stamford, Conn.) Cups and saucers made of these plastics are not stained by coffee and can be dyed in light colors which do not fade. In paint, melamine resins give a porcelain-like finish which resists aging, discoloration and heat up to 300 degrees Fahrenheit.

Science News Letter, September 28, 1940

INVENTION

New Electric Stopwatch Counts Seconds and Tenths

AN electric stopwatch counts seconds and tenths of seconds just as the speedometer of your car counts the mileage of your trips. (Precision Scientific Co., Chicago) It is connected to the standard 110-volt A. C. lighting circuit. Pressing a button on the front starts and stops it, while a knob on the side is turned to reset it.

Science News Letter, September 28, 1940

IN SCIENCE

BOTANY

Beautiful, Though Spectral, Are Indian Pipe Flowers

See Front Cover

NEITHER pallid giraffes from some weird African fairyland nor ghostly sea-horses from ocean's unexplored abysses are the objects pictured on the front cover of this week's *SCIENCE NEWS LETTER*; though these were suggestions of imaginative persons to whom the photograph was first shown. They are simply a group of Indian pipe flowers, found in moist woods near Washington by Science Service's photographer, Fremont Davis.

The Indian pipe plant belongs to that strange, varied brotherhood of flowering plants that have taken to the ways of fungi, live either as parasites preying on living organisms or as saprophytes feasting on the dead, and so have lost any need for the food-making chlorophyll that gives green color to most of the higher plants. The Indian pipe is saprophytic, thus to some extent justifying its somewhat macabre alias, "corpse plant"; though it feeds only on dead plant remains, not on actual corpses. It still retains leaves, though as can be seen in the picture these are reduced to mere flaccid vestiges, practically without function.

Science News Letter, September 28, 1940

INVENTIONS

Miniature Respirator Fits in Vest Pocket

AMINIATURE respirator for protection against breathing of smoke or dust is so small that it can be carried in the vest pocket. (H. S. Cover, South Bend, Ind.) The person wearing it can talk, eat, sleep, smoke, and even wear spectacles. The nose piece is of soft pliable rubber, which will fit a nose of any shape, and the filter is folded in such a manner that about nine square inches of filtration area is provided. Elastic loops, slipped around the ears, hold it in position.

Science News Letter, September 28, 1940

ANCE FIELDS

RADIO

Antenna for Autos Curls Up Out of Way

A RADIO antenna for automobiles and other vehicles makes use of the same principle as the old tickler used to enliven parties (Berlin invention). These are the gadgets into which you blow, and a coiled paper tube unwinds, whistling as it does so. A butterfly's tongue operates in the same manner. The antenna uses a metal tube, and air is forced in from a hand pump to extend it. When a valve is opened, the air is released, and the antenna is recoiled.

Science News Letter, September 28, 1940

ETHNOLOGY

Indian Dictators Ran Wars In American Wild West

SPEAKING of war, as Americans inevitably do these days, here is how one of the most warlike American groups—Comanche Indians of the Wild West—ran their wars with a dictator expedition leader, volunteer followers, and some pretty astute psychology.

Comanches were war specialists, it appears from a study of their political and legal usages just reported by Dr. E. Adamson Hoebel of New York University. For a Comanche man or boy, the chief interest in life centered around war and raiding, Dr. Hoebel finds.

Any Comanche had the right to start a war. Unless he had enough influence to attract followers, the war party was apt to remain just a private fight. But if an Indian of strong reputation called for followers, a war was generally on.

Conscription was unknown among individualistic Comanches. Volunteers were literally drummed up by the would-be leader, who drummed and sang war songs in his tipi, hoping joiners would come to sing with him. Later, the recruits danced the war dance, each aided by a partner—the girl he would leave behind him.

Absolute dictator was the role assumed by the Comanche war leader, for the duration, and some raiding parties were gone more than a year, Dr. Hoebel points out. Comanches say that the system

worked because fighters went only with a leader of trusted ability, and were well aware that disobedience might bring disaster to all. A fighter who lost confidence simply went home. No instance of a Comanche war leader exerting force to control his men could be uncovered by the anthropologist.

Comanches made peace with the United States more than 100 years ago, but continued until the 1870s to rate Texas and Mexico as enemy soil, and fair ground for raiding. Capture of horses, love of adventure, and war honors were three attractions wars and raids offered to these Indians.

The war bonnet, highest fighting award, was won by Comanches generally for coups—exploits of killing enemies at close range with bravery. Wearing a war bonnet, a Comanche could never retreat, and his feathered headpiece made him a conspicuous rallying point in battles.

When Comanche raiders garnered in a herd of horses by stealth or fighting, they sought a safe distance to divide spoils. Apportioning the much-coveted horses, which were a badge of wealth, the leader gave first choice to his most able and helpful men. Then, the rest took theirs, provided there were enough to go around. And the leader, says Dr. Hoebel, was content with last of the pickings, or none, if need be. A reputation for fair division of spoils helped a war leader's prestige, and won him followers for another fight.

Science News Letter, September 28, 1940

INVENTION

Dated Eggs Possible With Automatic Stamper

DATED EGGS are possible with a recent invention, which marks the date automatically as it is being candled. (U. S. Patent 2,213,009, Bernard Knopp, Bennett, Nebr.) As the candler holds the egg to the light a rubber stamp marks it.

Science News Letter, September 28, 1940

CHEMISTRY

Transparent "Glass" Shoes For Modern Cinderella

TRANSSPARENT shoes have recently been introduced. (Saks-Fifth Ave.) They are made from the same transparent flexible plastic that has for some time been used for belts, suspenders, wrist watch straps, etc. Some are clear, others colored, making many effects possible.

Science News Letter, September 28, 1940

MATHEMATICS

Higher Mathematics Now Aids National Defense

HIGHER mathematics have come to the aid of the national defense, it was disclosed at the University of Pennsylvania Bicentennial Conference. Capt. Leslie E. Simons, of the Ordnance Department, U. S. Army, told how statistical methods are being used to make the testing of samples of ammunition speedier and less expensive.

Hitherto it has been necessary to use up rather large samples of any given lot of ammunition, to get an idea of quality and dependability of the lot as a whole. In the new method, smaller samples are used, but all previous experiences with the same manufacturer are taken into consideration in calculating the results. If the performance of these small samples falls within the range of previous experience, only the first batch is subjected to further tests with large samples. If the initial test goes too far wide of previous experience, every lot may have to be subjected to the expensive large sample testing procedure. Thus there is an incentive to manufacturers not only to make the quality of their products high but to keep it high.

Science News Letter, September 28, 1940

CHEMISTRY

New Device Recovers Carbon Tetrachloride

DRY CLEANERS may now reclaim the carbon tetrachloride and other liquids that they use for their work with an automatic solvent still. (Circo Products.) The grease or oil-laden solvent is poured into the top of the still, which is electrically heated. The clean, distilled solvent is collected in one container, from which it may be drawn off, the oil or grease in another.

Science News Letter, September 28, 1940

INVENTIONS

Portable Electric Roaster Tells Temperature Within

A PORTABLE automatic electric roaster is now made with a device formerly used only on large ranges which tells by colored lights the degree to which the temperature control has been set. (General Electric Company.) The temperature, from 150 to 550 degrees, is controlled by a thermostat. The roaster can accommodate a 20-pound turkey.

Science News Letter, September 28, 1940

ASTRONOMY

Solar Eclipse

South America and South Africa To Witness Totality; Our Glimpse Will Be in Florida Where It Is Partial

By JAMES STOKLEY

MOST important of the astronomical events of October is the eclipse on the first. Unfortunately, it is almost completely invisible in the United States. Only Florida is excepted. There, on that day, the sun will rise partially eclipsed. People at Miami, for instance, may be able to look out over the sea as the sun appears, and, if there is any mist to permit looking directly at it, a small piece will appear bitten out of its upper edge. This will be the moon, partly in front of it.

Farther south, along a path crossing northern South America, the south Atlantic Ocean and South Africa, the moon will come precisely in front of the sun; there a total solar eclipse will be visible.

Along this path are astronomers from five organizations in the United States.

In Brazil, in the region of Recife, which we used to call Pernambuco, are the parties representing Brown University, the Skyscrapers, amateur astronomical society of Providence, R. I., the National Bureau of Standards and the National Geographic Society. In South Africa is an expedition from the Cruft Laboratory of Harvard University.

These scientists will make the many observations possible only when the moon hides the sun. They will see and photograph the corona, the sun's outer layer, best observed then. They will study, by its spectrum, the sun's atmosphere. They will send radio waves up to the sky, and record the echo, to learn more about the sun's effect on radio transmission. Thus, they will contribute a little to our knowledge of the universe.

Look in the eastern sky these evenings and you will see two planets, neighbor

worlds that, with the earth, are revolving around the sun. Brightest is Jupiter, easy to find. Beside it, to the right, is Saturn, considerably fainter, but brighter than most of the stars.

At the beginning of the month Jupiter will be to the west of Saturn, but on October 11 they change places. This is the second time this year that one of these planets has passed the other. They did it August 15, when both were moving to the east. Jupiter was the more rapid.

Around September 1, as the faster-moving earth approached them, they seemed to turn and go backwards, that is, to the west, and they are now moving in that direction. Actually, they are now going the same way they did during the summer. Their retrograde movement is caused in the same manner as the apparent backward motion of a freight train when you overtake it in an express.

Triple Conjunction

Early in 1941, when we have swung well past, the planets will resume their easterly course, and on February 20, for the third time in less than a year, Jupiter will pass Saturn. This phenomenon is called a "triple conjunction," and is extremely rare, occurring about four times in a thousand years.

On the night of October 17, Jupiter and Saturn will be joined by the full moon, which passes them earlier that evening. Ten days later the moon, then visible in a crescent phase some time after midnight, will pass the planet Venus, now the brilliant morning star, easily seen in the east for some time before sunrise.

It cannot be guaranteed, but there is a possibility that this month may bring a fine shower of meteors, or "shooting stars." On the evening of October 9, 1933, such a shower was seen in Europe. Some 500 meteors per minute were seen at the shower's height. By 11:00 p. m., European time, the shower was over, before sunset in the United States, so we did not see it.

Connected With Comet

These meteors seem to be connected with Giacobini's comet, which returns every $6\frac{1}{2}$ years. A small shower was seen in 1926, seven years earlier. Now that another seven years have passed, there may be another, about October 9



THE SCHWARZSCHILD CAMERA

This instrument will be used for the eclipse by Dr. Charles H. Smiley, who stands in the rear. To the right is W. Edwin Stevens and to the left is J. Frank Morrissey, amateur astronomers who built it. Light falls on a large mirror at the bottom, is reflected to the smaller mirror, of which the back can be seen in the tube, then down again to the photographic film.



this year. These meteors seem to emerge from the constellation of Draco, in the north. Therefore one should watch this part of the sky from about the seventh until the eleventh, and a beautiful spectacle may be the reward.

In the eastern sky, there may also be seen the first contingent of those glorious stars that shine so brightly in the heavens of winter.

The accompanying maps show the way the heavens look, about 10:00 p. m. on October 1, 9:00 p. m. on the 15th and 8:00 p. m. on the 31st.

Lower than Jupiter, and to the left, is ruddy Aldebaran, marking Taurus, the bull. Above is a faint cluster of stars, of which most people can see six, called the Pleiades, the seven sisters, also in the constellation of Taurus. About as high, and farther north, is brilliant Capella, in Auriga, the charioteer.

Directly south we see Fomalhaut, of Piscis Austrinus, the southern fish, while to the southeast, a little higher, is Deneb Kaitos, the tail of Cetus, the whale. Above this is the large group, containing no very bright stars, of Pisces, the fishes. Above Fomalhaut is Aquarius, the water-carrier, and above that Pegasus, the winged horse, in which three stars com-

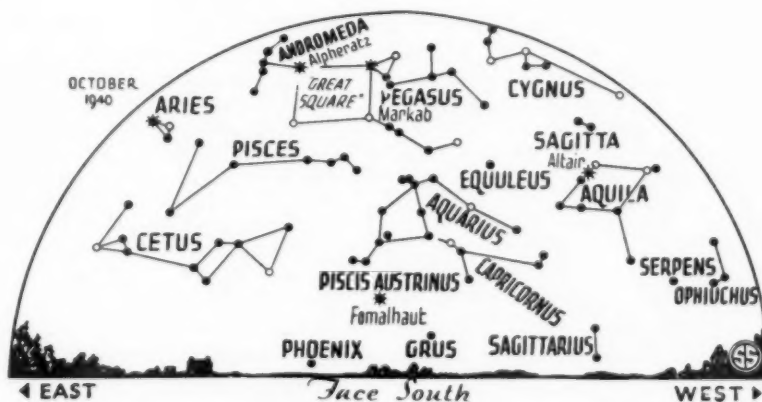
bine with a fourth in neighboring Andromeda to form the "great square."

In the west, soon to disappear from view, are some of the stars that we saw overhead in summer evenings. The most brilliant is Vega, of Lyra, the lyre. Above it is Deneb, in Cygnus, the swan, which has the shape of a cross, Deneb at the top. High in the southwest is Altair, of Aquila, the eagle.

Of the circle of stars in the north which never set, Cassiopeia, the queen, is now most prominent. Low in the north is the great dipper, in Ursa Major, the great bear, containing the two pointers, which show the way to the pole star. And above the dipper are the stars of Draco, the dragon, that huge snakelike creature which winds around the pole.

Astronomical Time Table for October

Tuesday, Oct. 1, total eclipse of sun, visible in South America and South Africa; 7:41 a.m., New moon; 11:00 a.m., Moon nearest—221,900 miles away. **Tuesday, Oct. 8**, 1:18 a.m., Moon in first quarter. **Friday, Oct. 11**, 6:00 p.m., Jupiter passes Saturn. **Tuesday, Oct. 15**, 5:00 a.m., Moon farthest—252,400 miles away. **Wednesday, Oct. 15**, 3:15 a.m., Moon full. **Thursday, Oct. 17**, 6:41 p.m., Moon passes Jupiter; 7:14 p.m., Moon passes Saturn. **Sunday, Oct. 20**, 11:00



• • • • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

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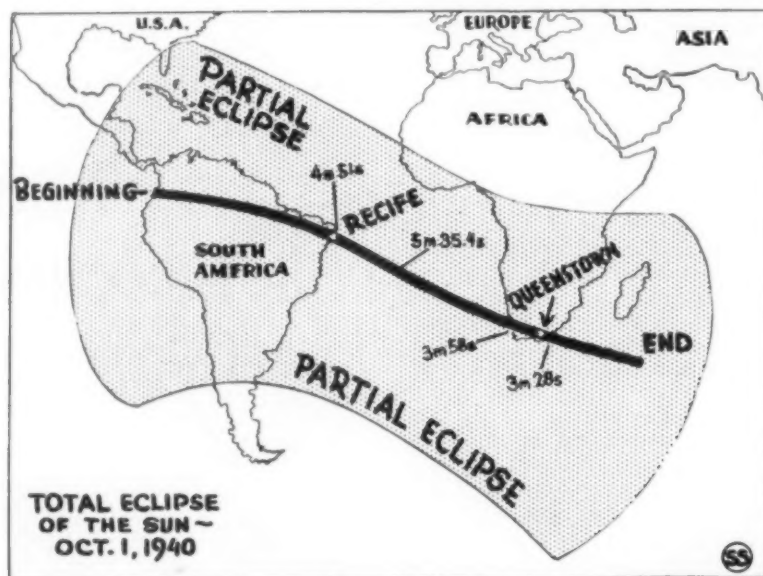
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ECLIPSE PATH

The heavy line shows where the total eclipse will be seen, beginning at sunrise on the coast of Colombia and ending at sunset in the Indian Ocean. A partial eclipse will be visible over the larger shaded area.

a.m., Mercury farthest east of sun. Thursday, Oct. 24, 1:04 a.m., Moon in last quarter. Sunday, Oct. 27, 10:43 p.m., Moon passes Venus. Tuesday, Oct. 29, 11:00 p.m., Moon nearest—222,500 miles away. Wednesday, Oct. 30, 5:03 p.m., New moon.

Eastern standard time throughout.

Science News Letter, September 28, 1940

Dive bombers were first developed by the U. S. Navy.

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From Page 199

son's studies are made at Needham, Mass., where he records nightly the intensity of signals received from a broadcast station in Chicago. Such a distance is required so that waves will travel up to one of these reflecting layers, a hundred miles above ground, and be sent down again.

During the day, the station cannot be received, but after sunset reception begins, and gradually improves, as the sun descends farther below the horizon.

Domed Telescope Lens

BY adding to the usual lens, consisting of two pieces of glass, a third one in the shape of a glass dome without any magnifying or reducing power, Miss Ann Estelle Glancy, of the American Optical Company, has designed a new lens for astronomical telescopes that will have many advantages over older types. It can be made larger, in proportion to the length of the telescope, which means that it will gather more light. This quality is sought by astronomers, both in visual telescopes and in star cameras.

Miss Glancy described the new design for the first time at the meeting. Even though the dome-shaped lens, which is called a plano-meniscus, does not have any magnifying power, it changes the course of the light rays in such a way as to give the characteristics desired.

RADIO

P. C. Sandretto, of United Air Lines, will describe the "Visual Highways of the Air," the visual radio range, as guest scientist on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, Oct. 3, 4:00 p.m. EST, 3:00 CST, 2:00 MST, 1:00 PST.

Listen in on your local station. Listen in each Thursday.

Probably the same principle can also be used to advantage in lenses for ordinary cameras, microscopes and projectors, she said.

Science News Letter, September 28, 1940

Hour Glass Star

A STAR that may be shaped like an hour glass, with a tail extending from one bulb, was the strange object pictured for the astronomers by Dr. Gerard P. Kuiper, of the Yerkes Observatory of the University of Chicago. Such a construction, he explained, would account for the mysterious changes seen in the spectrum of the star called Sheliak, or beta Lyrae, in the constellation Lyra, the lyre. This group is now seen high in the west in the evening, and is marked by the bright star Vega.

Beta Lyrae, Dr. Kuiper suggested, is a double star in which the two parts are actually fused together. The larger part, about half again as big as the smaller one, tends to contract, and this sets up a circulation of material into the smaller part. So fast is this, some 200 miles per second, that a portion of the stuff is actually ejected, forming the tail. This whips around as the hour glass rotates every thirteen days around its neck. Sometimes we view the rest of the star through the tail, and this causes certain of the changes in the spectrum.

Science News Letter, September 28, 1940

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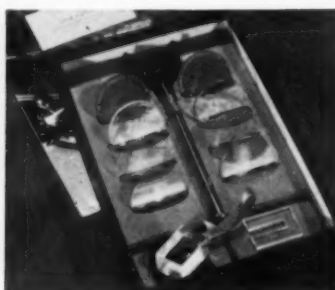
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6 New Polaroid* Products

These new Polaroid laboratory products offer new opportunities for instruction in polarized light, to keep pace with the widening applications of light polarization in everyday life. The new kits provide great convenience and range of utility. Price reductions of as much as 70% bring Polaroid materials within reach of the most restricted elementary school budgets. Detailed descriptions appear in a new catalog, free on request.



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NEW POLAROID EXPERIMENTAL KIT (Laboratory Type) may be used for all basic demonstrations of polarized light with optical bench, projector, or by hand. Contains two Polaroid Laboratory J-Filters, newly designed metal V-block to hold polarizers and accessories, and 8 specimens. Kit (No. 420) complete with 48-page text "Introduction to Polarized Light and its Application" and special instruction manual: \$9.75.



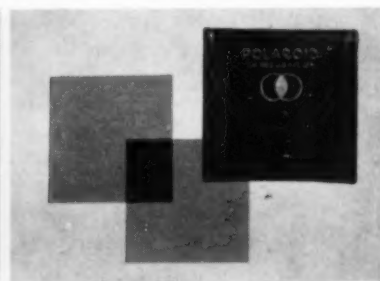
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NEW POLAROID PHOTOELASTIC SPECIMENS. This Kit and the **PROJECTOR POLARISCOPE** described at left offer the first convenient and economical means of using photoelastic methods in teaching structural design. Brilliant stress patterns in typical structures give striking visualization of stress reactions. For physics, optics, and engineering design classes. Kit contains 6 molded Bakelite specimens, frame for applying stress. 48-page textbook and special instruction manual (No. 449): \$9.75. Polariscope (No. 438): \$9.75.



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ASTRONOMY

Cunningham Comet May Be Bright for Christmas Night

THE NEW Cunningham comet will probably be easily visible to the naked eye in time to decorate the sky on Christmas eve, Leland E. Cunningham, who discovered it on a photograph made at the Harvard College Observatory, told Science Service.

He has made a preliminary computation of its movement, based on three observations made Aug. 25, Sept. 5, and Sept. 9. This indicates that it will be nearest the sun on January 19, 1941. Then it will be less than three-fifths as far from the sun as we are, or about 36,000,000 miles.

Because of the bright moonlight, the Harvard astronomers were unable to make additional observations immediately, since it was still quite faint, around the 13th magnitude. By the end of September, Mr. Cunningham expected to be able to make additional photographs. From these a more accurate orbit can be calculated. Then it will be known more definitely whether or not the comet will reach naked eye visibility.

He revealed that it lay undiscovered on several photographic plates while many prominent astronomers, members of the American Astronomical Society who had been meeting at Wellesley College, were visiting the Harvard observing station at Oak Ridge, on Sept. 14. The discovery plate was taken there on Sept. 5 with a star camera of the Ross type, equipped with an 8-inch lens. Because of the meeting, he did not get around to examining the plate until Sunday afternoon, Sept. 15, when he found the comet recorded. He also found it on the other two plates made Aug. 25 and Sept. 9. On the latter, it appeared not as a mere hazy blob of light, but showed a definite nucleus and a small tail. This indicated that it was approaching.

The new heavenly visitor is in the constellation Cygnus, the swan, which is directly overhead in the evening and is sometimes called the northern cross. Deneb is the bright star at the top of the cross—to the northeast. The comet has been moving westerly, north of Deneb, but Mr. Cunningham's figures indicate that it is turning toward the south.

The last comet visible to the naked eye was Hassel's, seen in April, 1939. Though of the third magnitude, quite bright, it was hard to find, because it was so close to the sun. The previous year was a very poor one for comets, but 1937 brought Finsler's comet, which was not conspicuous, but could be seen without a telescope during July. The summer of 1936 brought Peltier's comet, the discovery of an Ohio amateur, which also achieved naked eye visibility.

Science News Letter, September 28, 1940

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CHEMISTRY

Blending of Natural Rubber Improves Its Qualities

BY BLENDING a synthetic rubber, made from petroleum, with the natural product, a material is obtained which is improved in tensile strength and other important properties, S. Longman, of the Advance Solvents and Chemical Corporation, told the American Chemical Society in Detroit.

Natural rubber does not age well, he said, because it is very susceptible to oxidation by air, especially at high tem-

peratures. The synthetic rubber, known as Vistanex Polybutene, cannot be oxidized, or even vulcanized, and remains permanently plastic. Thus, the mixing process, technical details of which were presented, gives a product combining their properties.

Herman R. Thies, assistant manager of research and new products development of the Goodyear Tire and Rubber Company, told the rubber division how another rubber mixture could be used for making things all the way from golf ball covers to the coating of decorative silk and football and polo helmets.

Rubber, he said, may be changed from an elastic, extensible product to a stiff, horny, tough resin, called Pliolite. This can be mixed with rubber, and, when the mixture is vulcanized, the resin vulcanizes very little. The result has a very high impact resistance, is hard to cut and offers many applications.

One, he said, is in the field of thin insulation for electrical wiring. Only 40% as thick as the usual rubber covering, it has better insulating properties. This means a reduction both in size and weight of wire. Existing conduits may be made to carry more wires, and one man can carry at least twice the length of wire that was formerly a load. This would be important in warfare, in establishing communication lines in the field.

Another synthetic rubber, Perbunan, originally made in Germany, where it has largely replaced natural rubber, is now made in this country. This can be vulcanized, and handled the same as natural rubber in factory methods, reported C. A. Klebsattel, of the Advance Solvents and Chemical Corporation. Because of this, any rubber factory can easily change from one to the other.

In his paper, Mr. Klebsattel gave details as to the necessary ways in which Perbunan must be modified to secure the desired properties. As with rubber from trees, the addition of carbon black produces great changes, only they are much greater with Perbunan.

Science News Letter, September 28, 1940

Books

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The MICROSCOPIC WORLD

By FRANK THONE

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Dr. Thone, biological editor for Science Service and *Science News Letter* is a leading interpreter of science. Dr. George Roemmert, whose Micro-vivarium has been an outstanding feature of The New York World's Fair and The Century of Progress in Chicago and many educational and scientific exhibitions all over the country, has contributed many of the hundreds of pictures in the book.

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THE NEW NOAH'S ARK—André Demaison; translated by Eric Sutton—*Macmillan*, 294 p., \$2.50. An adventurous young Frenchman tells how he sailed a little schooner along the coast of Africa, collecting animals—a sort of Trader Horn of the tropic seas.

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